In-Flame Characterization of a 30 MWth Bio-Dust Flame

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Short introductive summary:

This work presents a comprehensive flame characterization campaign on an operating full-scale Dan-ish power plant. Amagerværket Unit 1 (AMV1, 350 MWth, 12 identical burners on 3 burner levels) is 100 % fuelled with wood dust burned in suspension and stabilized by swirling flows in a triple concentric low-NOx configuration. The measurements focus on a single 30 MWth flame and include: Quantifi-cation of the gas temperature, the gas phase composition: O2, CO, CO2, H2O, and light hydrocarbons by intrusive probe measurements. It also includes both seeded and unseeded 2D laser doppler anem-ometry (LDA) velocity measurements, flame shape observations by video imaging, and particle en-trainment by high speed infrared (IR) imaging. The flame is characterized along the geometrical cen-treline as well as in the horizontal and vertical plane of the flame. The results shed light on the flame anatomy of a full-scale burner and provide a comprehensive data set that quantifies key parameters: Gas phase temperature, composition, and flow field required in order to evaluate the performance of CFD simulations of complex combustion systems.

Presenter: **Joakim M. JOHANSEN, Technical University of Denmark, Chemical and Biochemical Engineering, Kongens Lyngby, DENMARK**

Presenter's biography:

I work to aid the development of improved combustion systems. The problems are approach a combination of experimental characterization and CFD simulations across scales from laboratory and bench-scale equipment to full-scale power plants.

Biographies and Short introductive summaries are supplied directly by presenters and are published here unedited

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